

CLAIMS

1. A vending machine comprising:
 - an article stocker that stores a plurality of articles;
 - an article moving mechanism that moves at least one of the plurality of articles stored in the article stocker into an article guide path;
 - a manual operation means that is manually driven; and
 - a drive force generation/transmission mechanism that generates a drive force by utilizing a force applied from the manual operation means and transmits the drive force to the article moving mechanism as an operation source;
 - the article stocker including a plurality of article receiving paths in which the plurality of articles are received and vertically stacked one upon another;
 - the plurality of article receiving paths being arranged to surround a vertically extending center line of the article stocker;
 - the article moving mechanism including a rotational shaft of which an axis line coincides with the center line of the article stocker, the rotating shaft being driven by the drive force to rotate the article stocker, and
 - the article moving mechanism being constructed so that the rotation of the rotating shaft causes the article to move from one of the plurality of article receiving paths into the article guide path, the article receiving paths being sequentially selected.

2. The vending machine according to claim 1, wherein the article moving mechanism includes:

a first moving mechanism that moves the articles from the plurality of article receiving paths to a predetermined position as the rotating shaft rotates, the article receiving paths being sequentially selected, and

a second moving mechanism that moves into the article guide path the articles that have been moved to the predetermined position by the rotation of the rotating shaft.

3. The vending machine according to claim 2, wherein the article stocker includes m (m is a positive integer of two or more) article receiving paths in which the plurality of articles are received and vertically stacked one upon another,

wherein the m article receiving paths surround the vertically extending center line, and separation walls, which separate two adjoining paths among the article receiving paths, are arranged to extend radially from the center line at an angular interval of $360^{\circ}/m$.

4. The vending machine according to claim 2, wherein the first moving mechanism of the article moving mechanism is a free-fall type moving mechanism including:

an upper partition wall and a lower partition wall, both disposed below the article stocker, vertically spaced from each other, and extending in a direction perpendicular to the rotating

shaft; and

an upper through-hole provided in the upper partition wall to allow one of the articles to fall therethrough from the selected one article receiving path onto the lower partition wall while the article stocker is rotating about the rotating shaft;

wherein the second moving mechanism is a rotary moving mechanism provided between the upper partition wall and the lower partition wall, and adapted to rotate together with the rotating shaft to put the article, which has fallen onto the lower partition wall, into the article guide path.

5. The vending machine according to claim 4, wherein a distance between the upper partition wall and the lower partition wall is determined so that the presence of the article that has fallen onto the lower partition wall prevents other articles situated above the fallen article from entering into the upper through-hole.

6. The vending machine according to claim 4, wherein the article stocker and the upper partition wall are constructed so that, until the article passes through the upper through-hole and falls onto the lower partition wall, the weight of the article received in the article receiving path is entirely supported by the upper partition wall.

7. The vending machine according to claim 4, wherein a guide wall is provided between the upper partition wall and the lower

partition wall, and adapted to guide the article, which has fallen onto the lower partition wall, into the article guide path.

8. The vending machine according to claim 1, wherein a case of the article is cubic-shaped,

the article stocker has four article receiving paths, and

an outline of a transverse cross section of the article receiving path includes two long sides longer than one side of the case and orthogonally crossing each other so that an intersection of the long sides is formed on a side of the center line, two short sides respectively extending from the distal ends of the two long sides in directions perpendicular to the long sides, and a curved side situated outside extensions of the two short sides and connecting the two short sides.

9. The vending machine according to claim 1, wherein the article stocker is constructed as one removable unit, and

the article stocker and the article moving mechanism are constructed so that when the article stocker is moved close to the article moving mechanism, the article stocker and the article moving mechanism work in concert with each other, and that when the article stocker is moved away from the article moving mechanism, they no longer work in concert with each other.

10. A vending machine comprising:

p article stockers (p is a positive integer of two or more)

that respectively store a plurality of articles;

one article guide path;

p drive force generation/transmission mechanisms, each including one manually driven manual operation means and being adapted to transmit a drive force to a driven portion by utilizing a force applied from the manual operation means; and

p article moving mechanisms, each driven by the drive force transmitted from each of the p drive force generation/transmission mechanisms to move one of the plurality of articles stored in the p article stockers into the one article guide path,

each of the p article stockers including m article receiving paths (m is a positive integer of two or more) in which the plurality of articles are received and vertically stacked one upon another,

the m article receiving paths surrounding a vertically extending center line of the article stocker, two adjoining paths among the article receiving paths being separated by separation walls provided to extend radially from the center line at an angular interval of $360^\circ/m$;

each of the p article moving mechanisms including a rotational shaft of which an axis line coincides with the center line of the corresponding article stocker, the rotating shaft being driven by the drive force to rotate the article stocker, and being constructed so that the rotation of the rotating shaft causes the article to move from one of the m article receiving paths into the article guide path, the article receiving paths

being sequentially selected;

the p drive force generation/transmission mechanisms being constructed to prevent two or more article moving mechanisms from moving the articles into the one article guide path simultaneously.

11. The vending machine according to claim 10, wherein each of the p article moving mechanisms includes the rotational shaft of which the axis line coincides with the center line of the corresponding article stocker, the rotating shaft being driven by the drive force to rotate the article stocker, a first moving mechanism that moves the articles from the plurality of article receiving paths to a predetermined position as the rotating shaft rotates, the article receiving paths being sequentially selected, and a second moving mechanism that moves into the article guide path the articles that have been moved to the predetermined position by the rotation of the rotating shaft;

wherein the first moving mechanism of the article moving mechanism is a free-fall type moving mechanism including;

an upper partition wall and a lower partition wall, both disposed below the article stocker, vertically spaced from each other, and extending in a direction perpendicular to the rotating shaft; and

an upper through-hole provided in the upper partition wall to allow one of the articles to fall therethrough from the one article receiving path onto the lower partition wall while the article stocker is rotating about the rotating shaft;

wherein the second moving mechanism is a rotary moving mechanism provided between the upper partition wall and the lower partition wall and adapted to rotate together with the rotating shaft to put the article, which has fallen onto the lower partition wall, into the article guide path;

wherein the upper partition wall and the lower partition wall are commonly provided for the p article moving mechanisms.

12. The vending machine according to claim 11, wherein a distance between the upper partition wall and the lower partition wall is determined so that the presence of the article that has fallen onto the lower partition wall prevents other articles situated above the fallen article from entering into the upper through-hole.

13. The vending machine according to claim 11, wherein the article stoker and the upper partition wall are constructed so that, until the article passes through the upper through-hole and falls onto the lower partition wall, the weight of the articles received in the article receiving paths is entirely supported by the upper partition wall.

14. The vending machine according to claim 10, wherein the drive force generation/transmission mechanisms and the article moving mechanisms are constructed to rotate the rotating shaft 360°/m for each operation;

wherein a shape and a position of the upper through-hole are

determined so that, when the rotating shaft is at rest at a rotation start position, the article does not fall from the article receiving path into the upper through-hole.

15. The vending machine according to claim 11, wherein a guide wall is provided between the upper partition wall and the lower partition wall, and adapted to guide the article, which has fallen onto the lower partition wall, into the article guide path.

16. The vending machine according to claim 11, wherein a case of the article is cubic-shaped,

the article stocker has four article receiving paths, and

an outline of a transverse cross section of the article receiving path includes two long sides longer than one side of the case and orthogonally crossing each other so that an intersection of the long sides is formed on a side of the center line, two short sides respectively extending from the distal ends of the two long sides in directions perpendicular to the long sides, and a curved side situated outside extensions of the two short sides and connecting the two short sides.

17. The vending machine according to claim 11, wherein the article stocker is constructed as one removable unit, and

the article stoker and the article moving mechanism are constructed so that when the article stocker is moved close to the article moving mechanism, the article stocker and the article moving mechanism work in concert with each other, and that when

the article stocker is moved away from the article moving mechanism, they no longer work in concert with each other.

18. The vending machine according to claim 11, further comprising a storage case which includes a front panel with the manual operation means arranged on the outside thereof and a case body detachably combined with the front panel,

wherein a frame is mounted onto a back of the front panel, where the article stockers, the article guide path, the drive force generation/transmission mechanisms and the article moving mechanisms are installed;

wherein a frame holding structure is installed inside the case body and adapted to hold the frame so that the frame can be drawn out forward from the case body.

19. The vending machine according to claim 18, wherein p coin slots respectively corresponding to the p article stockers are disposed in an upper half portion of the front panel, and the one manual operation means and one article dispensing opening are disposed in a lower half portion of the front panel, the manual operation means and the article dispensing opening being commonly provided for the p article stockers.

20. The vending machine according to claim 18, wherein the storage case is constructed so that a main portion of the article stocker can be seen from outside the storage case.